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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/937,715	01/16/2002	Philip S Russell	124-892	7024
21839	7590	04/05/2005	EXAMINER	
BURNS DOANE SWECKER & MATHIS L L P			SONG, SARAH U	
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ALEXANDRIA, VA 22313-1404			PAPER NUMBER	

2874

DATE MAILED: 04/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/937,715

**Applicant(s)**

RUSSELL ET AL.

**Examiner**

Sarah Song

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20,22-27 and 30-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-20,22-27,30 and 33-48 is/are allowed.
- 6) ☒ Claim(s) 31 and 32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. <u>0205</u> . |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                                |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>0305</u> . | 6) <input type="checkbox"/> Other: _____.  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 8, 2005 has been entered. Claims 1 and 10 have been amended. Claims 31-48 have been added. Claims 1-20, 22-27 and 30-48 are pending.

### ***Information Disclosure Statement***

2. The prior art documents submitted by the applicant in the Information Disclosure Statement filed on March 8, 2005 have all been considered and made of record (note the attached copy of form PTO-1449).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borrelli et al. (U.S. Patent 6,496,632 previously relied upon).**

5. Regarding claim 31, Borrelli et al. discloses a photonic crystal fibre comprising: a region of substantially uniform, lower refractive index 58; said lower refractive index region

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substantially surrounded by cladding 62 which includes non-coaxial regions 60 of higher refractive index and which is substantially periodic. See Figure 7 and paragraph spanning columns 8 and 9. Borrelli et al. does not expressly disclose said region of lower refractive index to have a longest transverse dimension of at least 9  $\mu\text{m}$ . However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the region of lower refractive index to be at least 9  $\mu\text{m}$  since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. MPEP 2144.05(II)(A).

6. Regarding claim 32, the optical assembly comprising a light source and a photonic crystal fibre, wherein the crystal fibre comprises a region of substantially uniform, lower refractive index; said lower refractive index region substantially surrounded by cladding which includes non-coaxial regions of higher refractive index having an air filling fraction of more than 30% by volume of the cladding and which is substantially periodic is disclosed as admitted prior art as evidenced by the preamble of the Jepson claim 32. The admitted prior art discloses all of the limitations of claim 32 except for a longest transverse dimension which is sufficiently long to provide that the light emitted from the light source is substantially confined in the lower refractive index region. Figure 7 of Borrelli et al. appears to disclose a lower refractive index region comprising a longest transverse dimension, which is sufficiently long to provide that the light emitted from the light source is substantially confined in the lower refractive index region. One of ordinary skill in the art would have been motivated to provide the lower refractive index region of Borrelli et al. comprising a longest transverse dimension, which is sufficiently long to provide that the light emitted from the light source is substantially confined in the lower

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refractive index region in order to optimize the light guidance characteristics of the optical assembly for low loss propagation.

***Allowable Subject Matter***

7. Claims 1-20, 22-27, 30 and 33-48 are allowed.

8. The following is a statement of reasons for the indication of allowable subject matter: Claims 20 and 22-27 are allowable for the reasons stated in the Office Action dated June 13, 2003.

9. Regarding claims 1-19, 30 and 33-48, Borrelli et al. discloses an extruded fiber and therefore does not teach or render obvious a photonic crystal fiber comprising canes. Broeng et al. (U.S. Patent 6,845,204 newly cited) discloses a photonic band gap fiber; however the region of lower refractive index does not have a longest transverse dimension which is sufficiently large to provide that light is substantially confined in the lower refractive index region as discussed in column 24, lines 12-15. Furthermore, Broeng et al. states that “full confinement of light in air is—in principle—possible”, but does not disclose any embodiment to support the statement. Furthermore, Broeng et al. does not disclose or reasonably suggest the photonic crystal fiber comprising canes and wherein a cavity has a transverse dimension greater than a corresponding dimension of any of the canes.

***Response to Arguments***

10. Applicant's arguments filed March 8, 2005 have been fully considered but they are not persuasive. With regards to the limitation “wherein the region of lower refractive index has a longest transverse dimension which is sufficiently large to provide that light is substantially confined in the lower refractive index region,” it appears that the photonic crystal fiber disclosed

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by Borrelli et al. in Figure 7 would necessarily meet the functional limitation since the traditional index-guiding principle would not apply for the hollow core fiber.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sarah Song whose telephone number is 571-272-2359. The examiner can normally be reached on M-Th 7:30am - 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on 571-272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Sarah Song  
Patent Examiner  
Group Art Unit 2874